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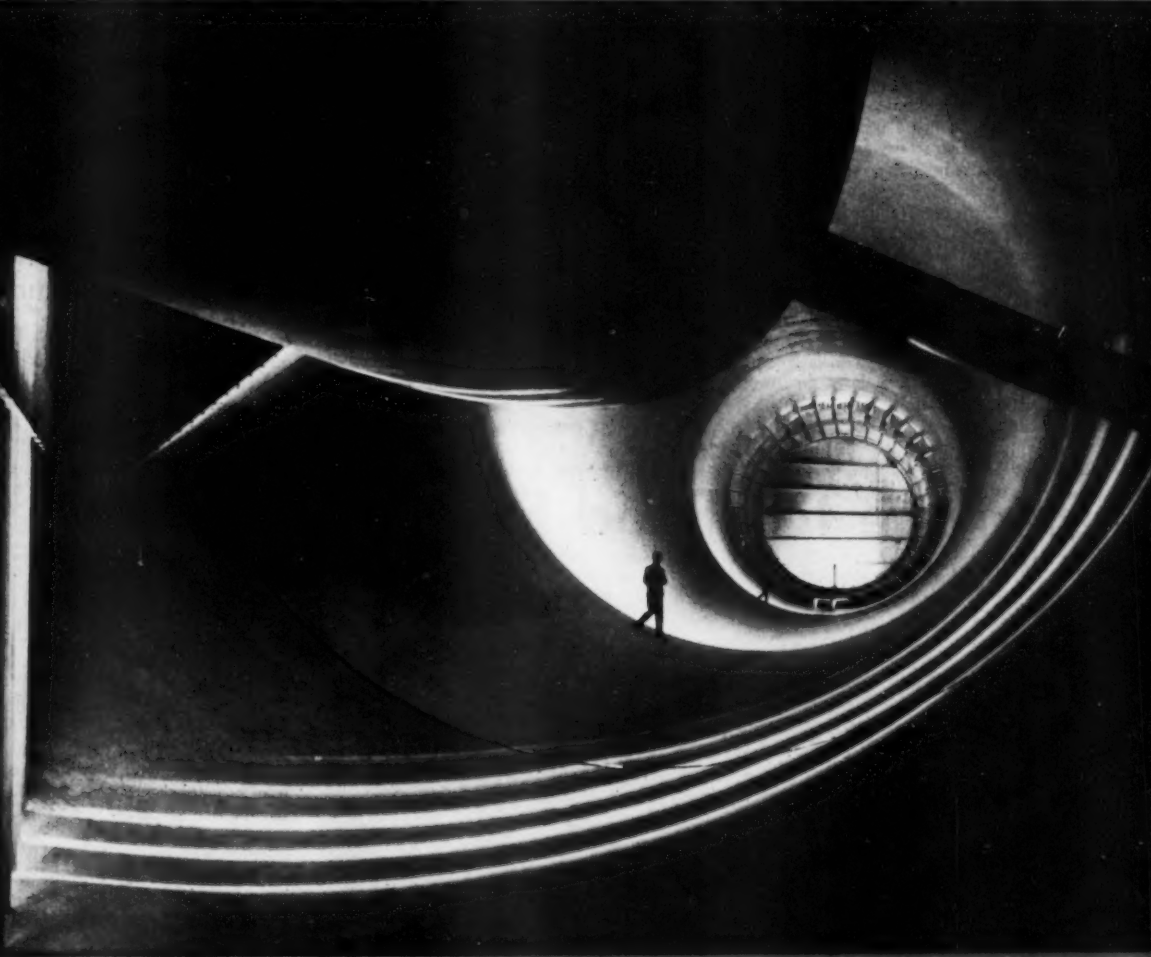
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JUN 18
1951

SCIENCE NEWS LETTER



THE WEEKLY SUMMARY OF CURRENT SCIENCE



Air Return Passage

See Page 342

A SCIENCE SERVICE PUBLICATION



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UNIV OF MICHIGAN
THE OBSERVATORY
ANN ARBOR MICH

PUBLIC HEALTH

Speedy Vaccine for 'Flu

Could make vaccine quickly to stop new strain of influenza, tests prove. Large number of laboratories would cooperate in the production.

► IF AN enemy tried to spread a new strain of influenza in this country as part of a germ warfare campaign, we could make a vaccine against it fast enough to stop the epidemic very quickly.

In a trial run with a strain of 'flu virus flown from England last January, one pharmaceutical house made 1,000 doses of vaccine in 22 days. Another made 1,000 doses in 23 days, Dr. W. Palmer Dearing, Acting Surgeon General of the U. S. Public Health Service, reported.

This means, he explained, that a large number of laboratories could produce enough vaccine in short enough time to meet the needs of this country "if threatened by the spread of a dangerous type of influenza from abroad."

If a new and virulent type of influenza started in this country, the vaccine could probably be made in time to reduce to a minimum its effects in large segments of the population.

Although the record 23-day vaccine production job was completed by the middle of February, news of it was withheld for a number of reasons. Chief among these,

presumably, was that Public Health Service and Defense Department officials were interested in it as a trial run of germ warfare defenses.

The influenza that was widespread last winter was so mild that vaccination against it was not thought advisable, but news of a vaccine might have swamped pharmaceutical houses with demands for it. The manufacturers were making the vaccine on the trial run at their own expense for the U. S. Influenza Study Program.

This program was organized in 1948 in cooperation with the World Health Organization by the Surgeons General of the Army, Navy, Air Force and Public Health Service. It gathers news of influenza outbreaks all over the world and isolates and studies the various strains of influenza viruses with a view to preparing vaccines.

While influenza might not be the particular germ warfare agent used by an enemy, experience with this modern type of 'flu fighting, and perhaps even the same organization, could be turned to stopping other germs in case of germ warfare.

Science News Letter, June 2, 1951

MEDICINE

Exercise for Tired Feet

► ARE YOU having trouble with your feet? Can they stand up under increasing avoirdupois? Do they feel tired at night?

Three simple exercises for tired feet are offered by Walter C. Crowe, Thayer Jorris and William Fowler, members of the developmental physical education staff at the University of California at Los Angeles.

1. The first exercise can be done while reading the evening paper. With the legs on a footstool, stretch and separate the toes as far as possible. Then grab with the toes, as if attempting to hold something tightly, until the feet start to tire.

2. The second exercise requires standing behind a chair with the hands resting on its back. Place the feet with the big toes together and heels three or four inches apart. Keeping the balls of the feet flat, bend the knees just slightly, rotating them outward as far as possible without moving heels or toes. Repeat five or ten times.

3. The third exercise requires walking forward slowly and naturally 10 to 15 steps. Just before each foot makes contact with the floor, turn the front part of the foot inward as far as possible—pigeon-toed manner.

Practice these exercises at least once a day and you will strengthen your foot muscles and reduce fatigue, the U.C.L.A. physical instructors say.

Science News Letter, June 2, 1951

PHYSICS

Rocketeers Reminded Earth Turns by Aiming Correction

► IF ANYONE doubts that the earth rotates, let him try aiming one of the record-breaking 250-mile-high rockets being fired by Army Ordnance from White Sands, N. Mex., proving grounds.

If the earth's rotation were disregarded, such a "Bumper" two-stage rocket would descend approximately 15 miles from its target. The earth would move that far under it during the 10 minutes that it is in the air, Robert P. Haviland, project engineer for General Electric Co., Schenectady, N. Y., conducting the firings, has computed.

There are approximately 10 variable factors taken into consideration when high-altitude rockets are fired. In addition to

the rotation of the earth, these include range and direction of the target, trajectory, geography, wind direction, wind velocity and air density. Rotation of earth was considered a minor factor in computing earlier rocket and guided missile trajectories.

Science News Letter, June 2, 1951

INVENTION

Warn Truck Drivers Of Low Underpass

► TRUCK DRIVERS entering an underpass on the highway will be able to determine if there is proper overhead clearance for the truck body with a device which brought Henry S. Marx, New York City, patent 2,554,371. A light or an alarm in the cab gives the warning. A flexible metal rod, attached to the front of the cab's roof, projects upward a little higher than the top of the truck's body. If it hits the roof of the underpass, it bends to make an electric connection that activates the signal.

Science News Letter, June 2, 1951

ZOOLOGY

Black Frogs Turn White After Shot of Hormone

► BLACK FROGS become white ten minutes after an injection of hormone extracted from their pituitary glands or from shrimp eye glands.

This is because the long delicate branches of dark pigment cells in the skin of frogs, fish and crustaceans suddenly contract when a dose of hormone is injected, explained Dr. Gottfried Koller, head of the zoology and comparative physiology department at the University of Saar in Saarbrücken.

These animals normally regulate the stretch of their pigment cells by themselves for protection from enemy eyes and jaws. For instance, when a frog is on a dark background, the pigment cells spread out in all directions in his skin, and he blends into the scenery. But if the frog should swim to a brighter background, he shoots out some hormone from his glands and contracts the pigment cells, thus leaving himself lighter in color.

Dr. Koller finds that the hypophysis glands of frogs and eyestalk glands of shrimp not only regulate the contraction of pigment but also regulate the content of water in the body of these animals.

Frogs and shrimp must have light for adaptation to their background, Dr. Koller explained further. After 24 hours in the dark, the gland extract loses its effectiveness. With only five minutes of light, however, the extract is again activated.

For his experiments, Dr. Koller uses one part of extract to one million parts of water. One or two hours after the injection, the animal again becomes his natural color.

Science News Letter, June 2, 1951

MEDICINE

Test Resistance to Strain

Harvard's varsity and combination crews helped in finding blood test to tell those able to withstand emotional stress and strain.

► THE HARVARD varsity and combination crews have helped scientists find a simple blood test to screen persons for ability to take emotional stress and strain.

The test is for the number of eosinophil cells circulating in the blood. These cells get their name because they are easily stained by the rose colored dye, eosin.

The number of them circulating in the blood, according to scientific theory, is an index to whether the adrenal glands, producers of cortisone and adrenalin, are responding normally to stress. Normal glands in a person under stress presumably produce more of the hormones which in turn reduces the number of eosinophils.

To test this theory under really strenuous situations, instead of under artificial, laboratory stress situations, four Harvard medical scientists made eosinophil blood tests on coaches, coxswains and crewmen during training for and before-and-after the Harvard-Yale races last June. The scientists are Drs. Albert E. Renold, T. B. Quigley, Harrison E. Kennard and George W. Thorn.

Sports fans will remember that this varsity four-mile race was, as the scientists put it, "extremely hard and tense, won by only a quarter of a length, with a spectacular and, to the crew, frightening finish."

In the varsity crew, within four hours of the first time trial for the race, the average eosinophil blood count of 123 was reduced to 19. Immediately before the actual race the average count was only 64 and fell to three within four hours.

Although the combination crew also showed a drop in eosinophil count after the time trial, there was no fall after the race, and in fact a slight rise from 42 to 59. The combination race, however, differed from the varsity in that it was won by six lengths, with Harvard leading easily all through and no doubt about the outcome.

"In well trained persons," the scientists conclude, "emotional stress, either alone or in combination with muscular activity, may lead to a highly effective adrenal stimulation."

This, they point out, may represent a necessary link in the body's mechanism of adaptation to stress.

By putting persons under conditions of standardized stress and making eosinophil blood counts, two groups can be easily identified. These are: 1. those with unsatisfactory response to stress; 2. trained persons in whom the particular exertion does

not exhaust physical or emotional reserves.

Both groups will show apparently inadequate eosinophil counts, because physical as well as emotional stress affects the stress adaptation mechanism. But, the scientists point out, the difference between the two groups will be obvious at a glance.

Details of the study are reported in the NEW ENGLAND JOURNAL OF MEDICINE (May 17).

Science News Letter, June 2, 1951

ASTRONOMY

New Camera Photographs Meteors Small as Buckshot

► A NEW camera, first ever designed exclusively for tracking meteors, will photograph 40 times as many "shooting stars" as are caught with sky cameras now in use.

Meteors as small as buckshot will be photographed by this 5,000-pound camera. The Super-Schmidt meteor camera is so fast its limiting exposure, even on a black cloudless night, is six minutes. The "wide-eyed" camera photographs one-tenth of the visible sky at one time.

Film for the camera will probably be

carried around in milk cans. It is shaped like a salad bowl because the converging light rays in the camera form a curved focal plane. The curved film holder and rotating shutter are placed in the center of the camera in front of the inner lens. Their position makes the camera unlike any other, because the optical system must be taken apart each time the camera is loaded.

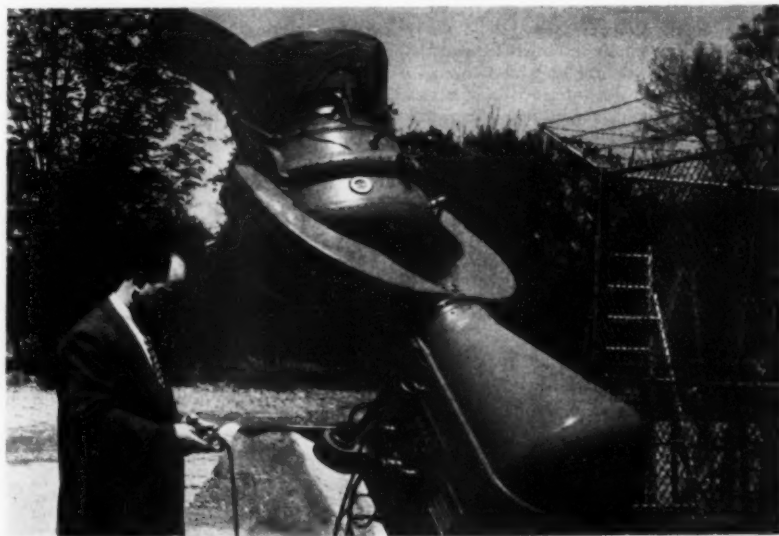
The camera is being flown to one of the Harvard Observatory's two meteor stations near Las Cruces, N. Mex. Another just like it, to be delivered within a few months, will be operated simultaneously about 18 miles away. Then meteors can be accurately tracked by comparing the positions of their bright trails on the two films.

Study of meteors is important to increasing our knowledge about the upper atmosphere. Because "shooting stars" perform much like bullets and other projectiles, such information is useful to the armed forces in their rocket experiments.

In all, six such meteor cameras are being made. In addition to the two for Harvard, which for the past decade or two under the direction of Dr. Fred L. Whipple has been pioneering in meteor research, two are for Canada's Dominion Observatory in Ottawa, and two for the U. S. Air Force Geophysical Research Directorate in Cambridge, Mass. Since 1946 the meteor program has been financed by the U. S. Navy.

The radically new optical system of the Super-Schmidt camera was designed by Dr. James G. Baker, Harvard research associate and chief optical consultant of the Perkin-Elmer Corporation, Norwalk, Conn., that is building the cameras.

Science News Letter, June 2, 1951



METEOR CAMERA—To learn more about meteors, this super-Schmidt camera will track and photograph shooting stars. Graham Wallace of the Perkin-Elmer Corporation of Norwalk, Conn., the firm that built the camera, is operating the aiming controls.

MEDICINE

Frontal Lobotomy Changes

Real physical changes occur after controversial frontal lobotomy operation on mentally ill persons, California doctors find.

► IMPROVEMENTS DERIVED from the controversial frontal lobotomy operation for persons with serious mental illness can be attributed to real physical changes rather than to psychological factors.

This was indicated in a report of University of California psychiatrists and surgeons to the California Medical Association.

One school of medical opinion has maintained that emotional shock, fear and intimidation are potent psychological factors entering into improvements achieved by the operation.

The procedure is used in patients who are greatly disturbed, very often in patients who are dangerous to themselves or others. It involves severing the fibers connecting the frontal brain lobes to the thalamus, another section of the brain, which controls the emotions. When the thalamus stops receiving messages, the emotional responses are greatly decreased.

To settle the controversy over the source of improvements, the California physicians divided a random group of 33 patients selected for the operation into two groups. One group received a bilateral lobotomy—the fibers of both frontal lobes were severed. The other group received a unilateral operation, with the fibers of just one lobe being cut.

At the end of six months all patients were examined by the psychiatrists, who at the time were not informed by the surgeons which patients had received which operation. It turned out that 11 out of 16

(68.8%) who received the bilateral operation were judged to be benefited; and 3 of 17 (17.6%) with the unilateral lobotomy were helped.

The 14 patients who had received the partial operation and were judged to be unimproved then had surgery to sever the fibers on the other side of the brain, thus giving a complete lobotomy. Beneficial results occurred in 11 (78.6%).

The scientists said this showed the benefits of the operation are more than merely psychic, that the complete operation is better than the partial one, and that it is an effective procedure in selected patients with chronic mental illness.

The scientists are Drs. Alexander Simon, Lester H. Margolis, Karl M. Bowman, and John E. Adams.

Science News Letter, June 2, 1951

INVENTION

Better Impregnation Process Forces Fluids into Cells

► FLUID COMPOSITIONS are forced into the innermost cells in porous material by a combination of a vacuum impregnation process and heat in an invention which brought patent 2,554,254 to Herbert M. Kroft, Baltimore, Md. Patent rights are assigned to Westinghouse Electric Corporation, East Pittsburgh, Pa. The process is particularly suitable in thoroughly saturating the fibrous insulation in electric coils with an insulating varnish.

In this process, as in other vacuum processes, the coils are placed in a chamber and the air, moisture and other volatiles removed, even from the tiny spaces within them. Then they are flooded with the insulating varnish and high pressure applied to drive the material into interior cells. In this new process, infra-red radiation supplies a temperature during the process of about 80 degrees Centigrade. The result is a complete impregnation.

Science News Letter, June 2, 1951

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ASTRONOMY

How small are the meteors to be photographed with the new meteor camera? p. 339.

INVENTION

How has the housewife's burden of a heavy iron been eased? p. 343.

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What is the leading cause of death for those in the age group 15 to 35? p. 341.

What is the new, life-saving use of cortisone? p. 351.

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How can those on the fringe areas for television reception receive better pictures? p. 345.

ZOOLOGY

How can black frogs be made to turn white? p. 338.

METEOROLOGY

Sunlight Spoils Particles

Silver iodide particles exposed to sunlight would probably lose ice-forming ability. Light changes their shape in the laboratory.

► A BODY blow was dealt to the million dollar rain making industry in the West, based on seeding of clouds with silver iodide particles.

Experiments carried out at the U. S. Air Force Cambridge Research Laboratories, in Massachusetts, have shown that "exposure to sunlight for at least 20 minutes would probably have sufficient effect to decrease the ice-forming capacity of silver iodide released on a clear day. Furthermore, for longer exposures to sunlight the ice-forming capacity would eventually be completely destroyed assuming that no other modifications, physical or chemical, take place as the silver iodide nuclei are dispersed in the atmosphere."

The making of rain is now being attempted on a wide scale in the West by commercial operators of ground silver iodide generators. They usually charge large sums to water-hungry ranchers for their services. The assumption is that particles of silver iodide, once they reach moisture-containing clouds, act as what the meteorologists call sublimation nuclei. In other words, the water vapor in the air forms around them as ice, without going through the liquid stage. Whether silver iodide or particles of matter naturally in the sky are used, this process is believed to be necessary to produce rain.

Edward C. Y. Inn, of the Air Force laboratories, discovered that light changes the shape of silver iodide crystals. They were used, and presumed to be efficient, because they are shaped like ice crystals. If their shape is changed, they cannot form ice. The process of changing the shape by light is similar to the process of change taking place in a photographic film when light strikes it.

Mr. Inn, using a light source in the laboratory on silver iodide nuclei in cloud chambers, discovered that they lost their power to make ice, and therefore rain, once they were changed in shape by the light.

Studies of the time it would take for silver iodide particles generated on the ground to reach a point where they can begin to operate as rain propagators have not been completed but it is known that the time is long.

Mr. Inn, when interviewed by Science Service, declared that, on the basis of his findings, he would not hire a man with a silver iodide generator to make rain for him.

However, he found that when silver iodide crystals which have been changed by light are taken out of the light, a curious "reversal" process takes place. Some of the former ice-like crystals change back into unstable crystal-like formations. The question, he said, is whether this can take place in the atmosphere through some other physical or chemical modification.

Science News Letter, June 2, 1951

MEDICINE

Tuberculosis Still Rates As Big Killer

► TUBERCULOSIS STILL ranks high as a killing disease, though great strides toward its conquest have been made. It kills about 40,000 persons a year in the United States, more than all other infectious diseases combined. It leads all diseases as a cause of death in the age group from 15 to 35, the National Tuberculosis Association states.

The causative agent of tuberculosis is the tubercle bacillus, identified in 1882 by the German bacteriologist, Robert Koch. Contributing factors are crowded living conditions and poor nutrition.

Tuberculosis may attack practically any organ of the body, but most commonly attacks the lungs. Pulmonary tuberculosis is responsible for 92% of all tuberculosis deaths.

Tuberculosis can be cured. The earlier it is diagnosed, the easier it is to treat. Thus, as soon as a person is found to have tuberculosis he should be placed under treatment.

Basic in the treatment is rest, preferably under medical supervision in a tuberculosis hospital.

While there is no substitute for bedrest in tuberculosis treatment, supplementary measures may be used. In recent years, drug therapy has frequently been found to be of aid, although there is no known drug which is a specific cure for the disease. The most useful drug is streptomycin and this is generally conceded to be most effective when used in combination with para-aminosalicylic acid (PAS). Surgery, including collapse therapy, is used at times. The surgery may vary from temporary collapse measures, such as pneumothorax and pneumoperitoneum, to more radical procedures, such as removal of part of a lung or the whole lung.

Science News Letter, June 2, 1951



TRANSPLANTED THYROID CANCER—Scientists at the National Cancer Institute have produced for the first time experimental cancers of the thyroid in animals. Protruding from the side of this mouse is a cancer which has grown from a tiny piece transplanted from the experimentally produced thyroid cancers.

MEDICINE

Chain Reaction Produces Abnormal Gland Activity

► BY SETTING up a chain reaction of abnormal gland activity, scientists at the National Cancer Institute have been able to produce for the first time experimental cancers of the thyroid gland in animals.

For this work the scientists, Drs. Harold P. Morris and Albert J. Dalton and Mrs. C. Dubnik Green, were awarded the 1951 Van Meter prize of the American Goiter Association.

Goiters are one result of thyroid gland disorder. Cancer of the thyroid, however, also occurs in humans. Being able to produce it in mice gives cancer fighters a new tool for further study of the disease, its causes and treatment. Once developed, the experimental thyroid cancers can be transplanted to normal mice.

The goiters were produced by giving the animals thiouracil, a drug which blocks the normal hormone production of the thyroid. In an effort to overcome this deficiency, the pituitary gland in the head steps up production of a thyroid-stimulating hormone. Under-production of other pituitary hormones may accompany this process.

Long time continuation of this unbalanced glandular condition, with prolonged stimulation of the thyroid, results in the cancers in the animals.

Science News Letter, June 2, 1951

AERONAUTICS

Plane Research Speeded

Large wind tunnels for supersonic research promise better fast planes. New type radar makes running speed record of airplane models.

See Front Cover

► **RAPID DEVELOPMENT** of airplanes to travel faster than sound is made possible with recent modifications of a giant 16-foot high-speed wind tunnel at Langley Aeronautical Laboratory to give transonic speeds, and of a four-by-four-foot supersonic tunnel. Supplementing these is a 11-inch hypersonic tunnel which operates at speeds ranging from five to ten times the speed of sound.

The Langley Laboratory near Hampton, Va., is one of three research establishments maintained by the National Advisory Committee for Aeronautics. These NACA laboratories do not design or build planes. The end product of their work is to acquire technical information which can be used by airplane designers, manufacturers and operators. Results of their studies are incorporated in practically every type of plane built in America.

The fact that these tunnels had been modified and repowered was revealed to a group of visiting science writers, who were conducted through the tunnel with a 16-foot test section and saw others at work. But details of the modifications were not disclosed for security reasons. It is believed no other nation has been able to make tunnel modifications to secure similar results.

The front cover of this week's *SCIENCE NEWS LETTER* shows an interior view of the long air return passage of this 16-foot transonic wind tunnel. Turning vanes to keep the air flowing smoothly are visible at the far end of the tunnel.

"Now, for the first time," said Floyd L. Thompson, chief of research of Langley Laboratory, "we are able to duplicate transonic flow conditions in the Laboratory with large models. This was made possible by the discovery of a way to eliminate the 'choking' effect that occurs in a wind tunnel when air rushes through the test section at nearly the speed of sound."

The fact that large wind tunnels can now be used to study airflow conditions at the speed of sound will give America a tremendous advantage in designing supersonic jet fighters, ultra-fast bombers, guided missiles and other very-high-speed aircraft, he stated.

"Scientists already have acquired sufficient information to predict with reasonable accuracy the over-all aerodynamic behavior of an airplane flying at low supersonic speeds," he added, "but every plane that flies faster than sound must pass twice

through the transonic region—at the beginning and end of the trip." This transonic region is roughly from 0.8 to 1.2 the speed of sound.

Track With New Radar

► **NEW TYPE** radar equipment in use on Wallops Island, Va., is making continuous records of the speeds of models of proposed airplanes traveling to great heights and at velocities up to four times that of sound. It is a radar that sends out a continuous radio wave instead of the intermittent waves commonly used.

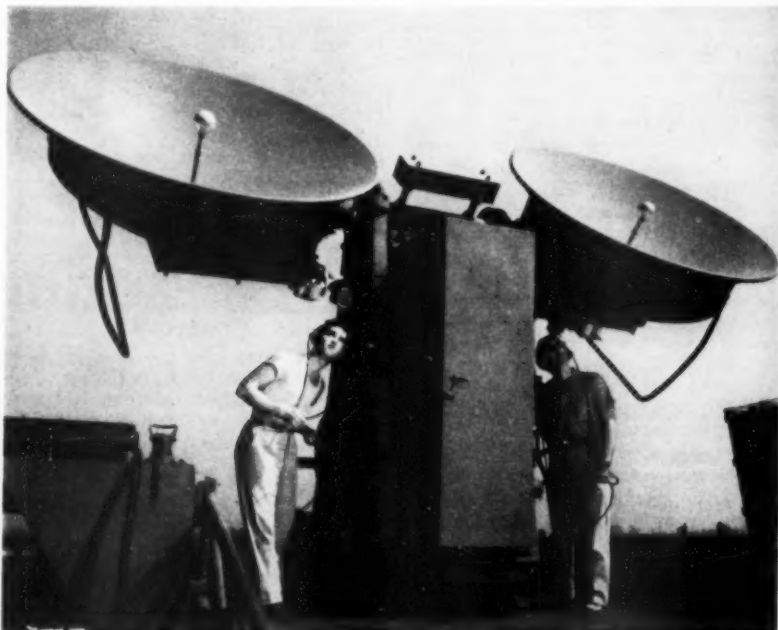
In this equipment, two large saucer-shaped antennas are placed side by side and move as a single unit. One is the transmitter, the other the receiver. Waves reflected back from the speeding model do not interfere with the waves being transmitted because their frequency has been slightly changed. This is due to what scientists call the Doppler effect. A familiar example of the Doppler effect is the change

to a bystander of the pitch of a locomotive whistle passing him at high speed.

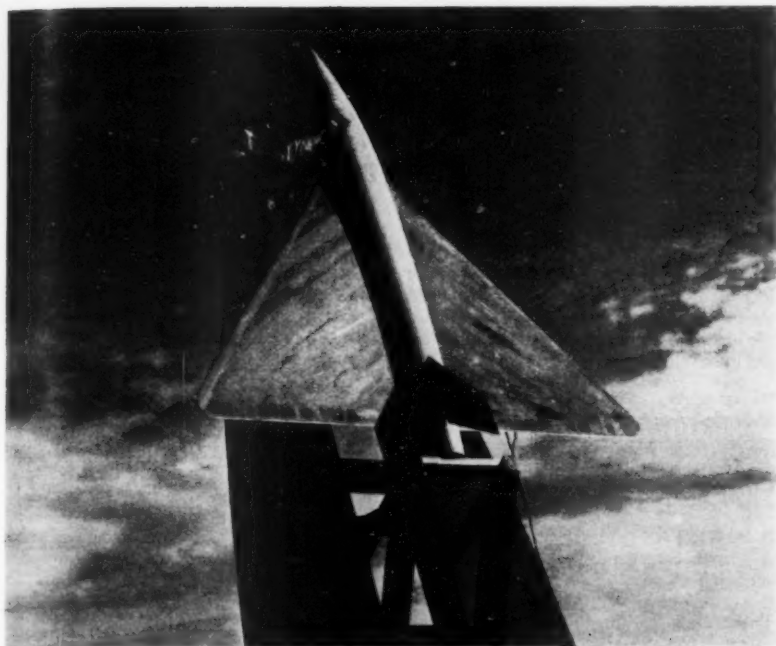
In fact, the device is called the continuous wave Doppler velocity radar. Only five of them have been constructed as yet, a group representing the science press was told by Robert R. Gilruth, chief of the Pilotless Aircraft Research Division of the Langley Laboratory conducted by the National Advisory Committee for Aeronautics.

This is the first time in the six-year-old history of this Langley Laboratory substation that "outsiders" have visited it. Until now, it has been behind a "security curtain." It is a "shooting" station for new aircraft designs developed at the Langley Laboratory. Wallops is a treeless, sandy stretch of land on the Atlantic coast from which the models can be projected high into the air to drop miles out in the ocean.

The aerodynamic information being gathered is for use in developing the supersonic planes of the future. The models are precision duplicates of proposed planes from four to perhaps 12 feet in length. They are propelled by rocket power to altitudes usually up to 30,000 feet, but sometimes to 100,000 feet. They travel from 15 to 40 miles a minute, the latter meaning between three and four times the speed of sound.



CONTINUOUS RADAR—This continuous wave Doppler velocity radar unit gives a running record of the speed of rocket-powered models. The operators track by sight and sound to keep their antennae properly aimed.



DELTA WING MODEL—Research model of a delta wing prepared for launching at the NACA's pilotless aircraft research station at Wallops Island, Va.

Although the models are lost at sea, their record is not. Their flight and behavior are recorded by motion pictures on fast-moving strip film. Two types of radar are used, the Doppler and a flight path radar. Very important are tiny telemeter

electronic instruments within the model which send radio signals continuously to instruments at the ground-station. They provide up to ten kinds of information on flight characteristics, including roll, drag, flutter and skin temperatures.

Science News Letter, June 2, 1951

NUTRITION

Special Foods for Wounded

► THE ARMY Medical Corps is looking for special foods for its wounded. Right now, wounded soldiers in Korea who need their nutritional balance re-established receive aid from an aid station hospital pack containing such hot, stimulating beverages as cocoa, tea and coffee.

However, this is not enough. Lieut. Col. Carl J. Koehn, chief of the nutrition branch in the Office of the Surgeon General, wants the food industry to develop a high protein, high calorie drink which could be simply prepared by medical corpsmen under front line conditions. It should be in dry powder form and probably be constituted of 60% milk, he said. It must taste good, too, he said, or the wounded men might not drink it. The powder must mix well with water and stay mixed so that it can be fed the wounded through nasal tubes if necessary.

This drink would be useful not only in the aid station at the front lines but

also at the clearing and collecting stations and in the evacuation hospitals. It would reduce the effect of shock and mean the difference between life and death for some of the wounded.

Clearing and collecting stations and also portable surgical and evacuation hospitals now are on what is called "operational B Rations" plus a fixed hospital ration supplement for the estimated 15% of the hospital population which medically would require more proteins. This does not meet the needs of a treatment diet.

Col. Koehn also wants industry to work on the problem of a stable fat emulsion to be used for vein feeding of patients when they cannot be fed either through the mouth or with a tube. This problem, complicated by the necessity of shipping and storing the emulsion, is admittedly difficult.

Science News Letter, June 2, 1951

PHYSICS

Moon Rocket Would Shed Sections on Way

► THE FIRST rocket to try to reach the moon will probably shed pieces from itself one by one during the trip.

With fuels now available, the best way to make the extremely long distance rocket flights to the moon or other planets would be a rocket built in stages, Anthony Nerad of the General Electric Research Laboratory told the New York section of the American Chemical Society.

These sections would drop off one by one after the fuel is used. Because of fuel costs, chemicals rather than atomic energy will be more likely to be used for rocket power, he said. Hydrogen gas seems to offer some important theoretical advantages for the propellant.

Science News Letter, June 2, 1951

SOCIOLOGY

Reduced Death Rates Give Hope Man Can Conquer War

► WAR'S CASUALTIES in an atomic age can be conquered by an application of man's social intelligence, judging by the way that we have been able to reduce the menace of deaths from airplane accidents, railroad travel, infected milk and lynchings.

Optimistically viewing the over-towering crisis of the atomic age, Dr. Hornell Hart, Duke University sociologist, reasons that our recent failure to achieve equal success with war casualties need not be regarded as conclusive.

The railroad death rate required 50 years to be reduced to one-tenth of its 1890 level. The airplane death rate was cut to one-tenth of its 1930 level in 15 years. Dr. Hart views this as evidence that social change is taking place at faster and faster rates.

The persistent decline of lynchings is regarded as especially significant by Dr. Hart because the lynching problem is considered parallel to the problem of dealing with international warfare.

Science News Letter, June 2, 1951

INVENTION

Magnets Help Housewives Ease Burden of Heavy Iron

► THE BURDEN of using a heavy flat-iron by the housewife, or exerting heavy downward pressure on a light iron, is relieved by a so-called magnetic electric iron on which patent 2,554,111 was awarded to Charles A. Leonard of Cincinnati, Ohio. It is an ordinary electric iron but within it are permanent magnets. The ironing board used with it contains a magnetic material. Magnetic attraction between iron and board gives the necessary pressure.

Science News Letter, June 2, 1951

PUBLIC HEALTH

Teach Your Children To Play Safely

► **MILLIONS** OF youngsters are now eagerly looking forward to the day when "school's out" and vacation starts. Lessons will be forgotten for the summer but safety lessons should be remembered. Parents who want to make vacation days safety days will follow these suggestions from the Minnesota Public Health Association:

Teach children the dangers of the street. Impress upon them the necessity of following traffic signals and of looking both ways before they cross the street.

Don't allow children to play in the street under any circumstances. There is a vacant lot or a playground in every neighborhood where children can play.

Forbid children to play near railroad tracks or crossings.

Teach children to pick up broken glass, rusty nails, rocks and sticks that might be lying around the yard. This simple precaution may prevent serious cuts and bruises.

Limit the use of matches to older children who are responsible. Teach children to strike matches away from themselves and to light fires with the wind blowing away from them. If, however, a child does play with fire and his clothes become ignited, he should be taught not to run, but to roll in the grass or on the pavement, or to wrap a coat or rug around him.

Swimming lessons are a good investment for children. Even if a child knows how to swim, he should not be allowed to go into the water alone.

Youngsters should realize that jumping in after a drowning victim is of no use unless the rescuer can swim well enough to keep the victim afloat or to bring him to safety.

As soon as they are old enough, children should be taught something about first aid. Even a seven-year-old can learn not to rub his eye when there is something in it, to stay out of the hot sun, unless he is protected from the rays, and to stay away from unfamiliar plants and weeds.

The most important rule of all is **BE CAREFUL**. Remember that every accident is caused by someone's carelessness.

Science News Letter, June 2, 1951

TECHNOLOGY

Air Jets Check Fabrics Rolling from Machines

► **A CONSTANT** check on the thickness of rubberized cord fabrics for automobile tires rolling from machines at 180 feet per minute is being made in England with two jets of air played on the moving fabric and a pressure measuring system in a pneumatic device.

This continuous pneumatic gaging system, developed by the British National

Physical Laboratory in Teddington, can also be used for the automatic gaging of wire, yarn and textile materials. It is of particular importance in the production of cord fabric for tires because this rubberized material is tacky and other methods of measuring its thickness present difficult problems.

In this continuous gaging device, the material under measurement is passed through a measuring head to which compressed air is supplied. The material restricts the outlet of the air, and the varying degrees of restriction as the material moves are reflected in variation of pressure in the pneumatic system. These variations are amplified and operate a recorder.

Science News Letter, June 2, 1951

INVENTION

Improve Magnetic Method Of Corrosion Detection

► **IMPORTANT** in oil production is an improved magnetic method of detecting corrosion in pipes underground, such as in the casing of an oil well. Joseph F. Bayhi, Tulsa, Okla., is the inventor. He received patent 2,553,350 with rights assigned to Standard Oil Development Company.

In this instrument, like in some other types, a bomb-like device holding a magnetic scanner is lowered into the well. In this, unlike in others, the signals produced by the scanner are unaffected by variations in the gap between the scanner and the walls of the pipe. The signals are produced by changes in the magnetic field caused by deformities in the pipe. The instrument invented by Mr. Bayhi will indicate corrosion either inside or outside the casing.

Science News Letter, June 2, 1951

GENERAL SCIENCE

Nine Years Draft Liability For Few Months Deferment

► **AN ESSENTIAL** worker in defense industry who receives an occupational deferment for a few months would find himself liable to the draft nine years longer than anyone else, if the House version of the draft bill is passed.

This was pointed out by the Engineers Joint Council, representing five large engineering societies, in a telegram to the Congressional conference committee on the draft bill. Under the House version, anyone receiving an occupational deferment would become liable for the draft until the age of 35, rather than 26. This would include college students.

The engineers council declared that few essential workers would ask for deferment under this provision and that this would seriously cripple defense industry. It asked that the Senate version of the bill, without this provision, be approved.

Science News Letter, June 2, 1951

IN SCIENCE

INVENTION

Barber May Now Sit While Cutting Hair

► **THE BARBER**, who has worked on his feet during the entire history of the modern barber shop, may now sit down while cutting his customer's hair, thanks to an inventor who received a patent from the government on a working stool for his comfort.

The stool is an adjustable one and can be raised to any desired height, moved inward and outward from the customer, and swung from the right side to the left side of the customer with the greatest of ease. It stands on its own support, which contains the adjustments. Its base is an extended affair that rests under the base of the customer's chair.

Inventor is George W. Booth, Charleston, W. Va. He received patent 2,553,545. Dentists can also use this swinging stool, he claims.

Science News Letter, June 2, 1951

ENGINEERING

Two-Cycle Engines Expand Use of Diesel Trucks

► **USE OF** the two-cycle principle in diesel engines for trucks, instead of the usual four-cycle principle, is responsible in large measure for the greatly increased number of diesel-powered trucks now in use, the Society of Automotive Engineers meeting in San Francisco was told.

Diesel truck sales totaled only 489 in 1938, the engineers were told by H. B. Ford of General Motors. During 1950, sales soared to 12, 669. Sales the present year are continuing on a high level and "the future heavy duty field looks predominantly diesel."

The adoption of the two-cycle principle presented many new problems. The two-cycle principle requires fuel injection to every cylinder each revolution of the crankshaft. Thus the injection system has to meter, time, build high pressure, and atomize twice as often as a four-cycle diesel at the same speed.

Another addition is the use of what Mr. Ford called the uniflow scavenging principle. In this, the piston uncovers ports in the bottom of the cylinder, allowing a fresh air supply under slight pressure to be forced through the cylinder. This pushes exhaust gases through two exhaust valves at the top of the cylinder. The valves are so timed that a quantity of scavenging air goes on past them and cools them.

Science News Letter, June 2, 1951

SCIENCE FIELDS

RADIO

Community Antennas Bring TV Programs

► "TV-BLIND" valleys and the fringes of television areas are now receiving good reception on home television receivers with the use of community antenna systems. Try-outs have already been made in at least two Pennsylvania mountainous areas and satisfactory results are reported.

In this community antenna system, a television pick-up and distribution service is installed on a high mast on the highest nearby elevation. Coaxial cables are used to bring the received TV signals from the antenna and distribute them through the area to be served. Amplifiers are used in the distribution system to boost the strength of the signals. Lead-off lines from the coaxial cables bring the signals into the homes. On the antenna mast are separate elements tuned for each channel on which programs are available.

An RCA installation at Pottsville, Pa., is now in operation. It is the RCA Community TV "Antenaplex." More than 275 families are now subscribers. Programs are received from three stations in Philadelphia, 75 miles away. Good reception is reported. Subscribers pay an initial fee of \$135, and \$3.75 monthly. This Antenaplex is an expanded version of a type now used in hotels and apartment houses.

Jerrold Electronics Corporation of Philadelphia also has a successful installation at Lansford, Pa., in Panther Valley, 75 miles from the nearest TV stations in Philadelphia. It is called the Jerrold Mul-TV Antenna system. It is a version of the Jerrold master antenna installations in many hotels, apartment houses and other buildings. The manufacturers claim that, in addition to its use in TV-blind valleys, it can be used to receive, amplify and distribute TV programs to homes in prairie country from 75 to 125 miles from the nearest TV station.

Science News Letter, June 2, 1951

TECHNOLOGY

Cobalt and Platinum Make Powerful Small Magnet

► TINY MAGNETS containing cobalt and platinum, made by General Electric, are claimed to be the world's most powerful permanent magnets in small sizes. (See SNL May 26.) They are less powerful in large sizes than some magnets long in use.

Laboratory experiments with the new magnet in the size of an eraser on a lead pencil show that it has a lifting power 24 times as great as a similar sized Alnico-5

magnet. The latter is generally rated as the most powerful now in commercial use. The eraser-size new magnet has about eight times more resistance to demagnetization than the Alnico-5, it is estimated. This resistance to demagnetization enables the cobalt-platinum magnet to be more efficient in smaller sizes than any permanent magnet now in commercial use.

Other advantages of the new magnet are its ductility, or ability to be drawn into wire or thin sheets, and its comparative ease of machining. Alnico magnets are machined only with great difficulty.

Production of the new magnet will be limited by the present shortage of cobalt for non-defense purposes and the high cost of platinum. Scientists do not foresee it replacing presently used Alnico magnets, but believe it may be used in new applications for which existing magnets are not suitable.

Science News Letter, June 2, 1951

AERONAUTICS

Jet Airliners Go on Regular Service Soon

► JET AIRLINERS will go into regular service on the London-Rome-Cairo route sometime next winter, it has been announced. Despite the rearmament program, British Overseas Airways Corporation in London will switch from piston engines to 490-miles-per-hour De Havilland Comet Jets, of which 14 have been already ordered.

A British-built jet airliner has been in experimental use during the past year. It is the success of this airplane that is responsible for the coming use of jet airliners on regular scheduled service. Recently it flew a non-stop route from London to Cairo, 2,200 miles, in 5.5 hours, half the time required for piston-type transports.

Science News Letter, June 2, 1951

ARCHAEOLOGY

Spring in Panama Yields Tons of Fossil Bones

► A SPRING in Panama, that existed probably even in ice-age days, has yielded up about three tons of fossil bone remains of horses, deer and turtles much like the animals of the same families today.

Dr. C. Lewis Gazin, Smithsonian Institution curator of vertebrate paleontology, made the collection, assisted by Franklin L. Pearce, also of the Smithsonian Institution. The spring is near the town of Pese on the Azuero Peninsula in western Panama, and is believed to have existed as a water-hole for the animals of that region during ice-age times.

Several limb bones and other parts of the skeleton of a mastodon, gigantic elephant-like animal, are included in the collection. The specimens are to be divided between the U. S. National Museum and the National Museum of Panama.

Science News Letter, June 2, 1951

MEDICINE

Bone Grafts in Future Will Be More Successful

► BETTER BONES for grafting and more success with the grafts are coming in the future, it appears from studies reported to the American Academy of Orthopaedic Surgeons. Some bones undergo a period of "death and resurrection" when transplanted to a new location, Drs. Marshall R. Urist of Los Angeles and Franklin C. McLean of the University of Chicago reported.

These are bones stored under refrigeration in hospital bone banks and called devitalized grafts. When these were placed in the front part of the eyes of rats, the bone bits "died." A month or two later, however, blood vessels and other cells from the surrounding eye tissue invaded the "dead" bone grafts. The grafts then acquired the ability to make new bone.

Growing cartilage or material from a bony callus on a healing broken bone was more powerful than bone itself in making new bone, these doctors found from their rat eye window studies. Bone grafts taken from other parts of the animal's body possessed inherited powers to make new bone. And grafts made directly without storage under refrigeration took in less time.

Bone for grafting can be stored in germ-free containers at room temperature, instead of in refrigerators, if it is preserved by a freeze-drying method. This new development in bone banks was reported by Capt. F. P. Kreuz and Drs. George W. Hyatt, T. C. Turner and A. G. Marrangoni of the U. S. Navy Medical Corps at Bethesda, Md.

Storage in a deep freeze cabinet, now customary, keeps bone for from three months to a year. But with the new method the bone can probably be stored for several years. In this method the bone is frozen, to stop the growth of germs, and then dried in a vacuum, something like the freeze-drying method of preserving blood plasma.

Science News Letter, June 2, 1951

INVENTION

Tandem Rotor Helicopter With Two Rotors Patented

► THE TANDEM rotor helicopter manufactured by the Piasecki Helicopter Corporation, Morton, Pa., is further protected by patent 2,552,864 issued to Frank N. Piasecki of Lansdowne, Pa. An important object of the invention is to provide a rotary wing aircraft having two rotors, one at the front and the other at the rear of an elongated fuselage, which are mounted and geared together in a relationship so that the rotors may intermesh when flapping without danger of blade interference. Another object of the invention is to provide a new and improved drive system arrangement.

Science News Letter, June 2, 1951

METEOROLOGY

Regular Flights Over North Pole

Discovered hundreds of times, the North Pole is routine turn-around point for airmen stationed in far north, learning to live with extreme cold.

By WADSWORTH LIKELY

► THE NORTH POLE has been "discovered" something like five or six hundred times by now. Nobody knows for sure.

In fact, Arctic explorers and the men of the Armed Forces who have to work in the cold north do not really care very much. Col. Bernt Balchen, long-time Arctic traveller and now commander of the 10th Air Rescue Squadron, says he has visited the Pole "three or four times," he doesn't know which.

Planes of his outfit have crossed the Pole somewhere between 30 and 50 times, Col. Balchen says, but nobody keeps a record of it. It is crossed only when it happens to be on the route of one of the flights.

The 375th Weather Reconnaissance Squadron makes routine flights every other day from Alaska to the Pole and back. Back in November the 375th celebrated their 375th flight to the top of the world. Probably another 75 flights since then have actually reached the Pole.

Before these regular flights were established other Air Force personnel visited the Pole on exploratory missions. Nobody knows how many times.

Once Unattainable Symbol

Once the symbol of something unattainable except by great courage and physical effort, the Pole is now merely a convenient turn-around point on a weather flight. Only 42 years ago the fact that it had been reached by Admiral Robert E. Peary was the occasion for banner headlines and for angry controversy. Now a crossing of the Equator is the occasion for more ceremony than a visit to the Pole.

The discovery of the Pole, in 1909, was the occasion for a heated, world-wide controversy. Admiral Peary's claim was disputed by Dr. Frederick Cook, but geographers and scientists gave the palm to Peary.

The Pole was not reached again until 1926 when Admiral Richard E. Byrd flew over it in a plane. Three days later, on May 12, the Amundsen-Ellsworth-Nobile expedition flew an airship over the Pole. Nobile accomplished this again in 1928.

The Pole was walked on a second time when a Soviet expedition landed several planes on an ice floe near the top of the world in May, 1937. Four members of the

expedition were left on the ice. They set up camp, established radio contact with Moscow and the outside world, made scientific observations, and stayed on the floe for nine months.

When they were finally taken off by a Soviet ice-breaker in February, they had travelled with the currents between 1,000 and 1,500 miles from the Pole. They had drifted two-thirds the way down the east coast of Greenland.

The Russians established the depth of the Arctic Ocean at the Pole as being more than 14,000 feet. They learned new things about the currents of the Arctic Ocean, about the existence of life in polar regions, about weather and about the possibilities of life on an ice floe.

In those days, they shared this kind of new knowledge with the rest of the world.

The war brought a halt to efforts to reach the Pole. However, cold weather living, knowledge of cold regions became

matters of concern to the armed forces of the world. Alaska became a training ground for troops, its islands a scene of battle, its skies a background for planes.

Arctic Ocean a Frontier

After the war, as relations with Russia became strained, the Arctic Ocean became a frontier, the North Pole a sort of boundary marker on the line between the east and the west.

Knowledge of the Arctic, its land and its ocean, then became more important than ever. The United States, remembering that Soviet trip on the ice floe and the extensive Arctic research carried on by the Russians through the 1920's and 30's, took steps to increase its knowledge.

Col. Balchen is one man who knows the Arctic. A pilot in two Air Forces, the Norwegian and the American, the Colonel knows the northern ocean by heart from Spitsbergen around through Greenland to Alaska. During the war he captured Germans who had set up weather stations in Greenland, flew supplies to Norwegian underground fighters and was an expert



THE NORTH POLE—This is the turning point for the routine weather flight made every other day from Fairbanks, Alaska, by the 375th Weather Reconnaissance Squadron of the Air Force.

for the armed forces on cold weather operations. Now he is convinced that if the "cold" war becomes "hot" it still will remain cold, in the weather sense.

Men can live comfortably in the Arctic, even at the North Pole, if they are sufficiently well trained and supplied. Col. Balchen points to the fighting last winter in Northern Korea. If the men had been trained in cold weather fighting, he believes, things might have gone better for them.

Adrift on Ice Floes

Looking toward the possibility of military operations in the Arctic in the event of another war, Col. Balchen has set men adrift on ice floes. Last spring a party of soldiers spent a short time on a floe, but they had to be evacuated.

It was not a lack of proper equipment, because Col. Balchen believes with his mentor, Fridtjof Nansen, that first necessity for life in the Arctic is good equipment and plenty of it. No, the men had simply picked the wrong kind of floe. But they are learning how to choose livable ice floes.

A recent discovery of the men of the 375th, on their flights to the Pole, may help considerably in the problem of living on the Arctic Ocean. They discovered, last year, three huge floating "islands." The largest was 25 miles wide, and, it was estimated, they are up to 200 feet thick.

If many of them exist, here are solid bases for landing strips, for camps and for scientific observations.

The islands, unlike the floes, are thought to be formed from ice built up on the shores of Arctic islands and broken off by a combination of wind and tide. Many more than the three already discovered might exist, Air Force officers believe. They were never seen before because observers did not know what to look for.

While the possibilities of these islands are being further investigated, Col. Balchen wants to experiment with living on the smaller, more dangerous ice floes.

Seek Approval for Camps

To test rescue equipment, clothing and food, and the endurance of man, he wants to set up nine camps, spaced out in the Beaufort Sea and the ocean along the 145th parallel from Alaska—right up to the North Pole.

This project is not yet approved by higher authorities, but Col. Balchen hopes it will be.

The men camped on the North Pole may even attempt to duplicate the feat of the four Russians in 1937. Col. Balchen believes that their observations of currents ought to be checked. Besides he believes that his men can do much more. The Russians had terrible equipment, he says.

With nine camps, evenly spaced out—at the start—a systematic check could be made on Arctic Ocean currents. There is still controversy over the flow of waters

in the ocean. Already, Col. Balchen has observed a current which flows in a big circle around the Beaufort Sea, just north of Alaska, with the part nearest the coast going eastward.

But Col. Balchen is not satisfied. Sitting at a desk in the Pentagon, he is eager to be back in his beloved North. He calls himself a one-man Chamber of Commerce for the Arctic. And he will not count his time wasted in the military maze if he can sell the idea that more of our soldiers and airmen need Arctic training.

Science News Letter, June 2, 1951

PUBLIC HEALTH

Lead Poisoning Is Summertime Hazard

► FOR SOME unknown reason lead poisoning among children occurs during mid-summer and warm weather, the Baltimore City Health Department points out. Five suggestions for protecting children from this hazard are given as follows:

1. Prevent your child from chewing painted objects. Most cases of lead poisoning in children occur between 18 months and three years of age. This is the time when children are teething and like to bite and chew. Watch such children carefully and do not let them chew painted surfaces (especially repainted woodwork) such as window sills, cribs, high chairs or other furniture, or toys. Inspect these surfaces for tooth marks to see if your child has chewed them. Give the child safe objects to chew, such as clean teething rings or hard rubber toys.

2. Prevent your child from eating dried paint flakes. Paint may crack and flake from old heavily coated surfaces. Children are known to pick up these flakes from the sill or the floor and eat them. Remove old paint from window sills before repainting with lead-free paint.

3. Use only paint which does not contain lead for repainting indoor surfaces, furniture or toys. Whenever you paint indoors read the label on the paint can carefully and be sure the paint does not contain lead. Do not buy paint for indoor use unless it is free from lead. If you are a tenant and the owner of the home is starting to paint indoors, be sure he uses lead-free paint.

4. If you use lead paint for outdoor painting and have some left over, do not use the remaining paint for work inside the house.

5. If your child has eaten paint containing lead, he may begin to show the signs of lead poisoning. If you see the following signs in your child, take him to the family physician at once for an examination and explain what has happened: Pains in the stomach, frequent nausea or vomiting, persistent constipation, irritability, frequent headache or convulsions.

Science News Letter, June 2, 1951

INVENTION

Patent Machine to Pick Up Stones from Plowed Soil

► THE BACK-BREAKING job of picking up stones on gravelly soil after plowing can now be done by a machine drawn by a farm tractor but operated by its own power. Stones are picked up by an inclined grating with teeth to dig into the earth on its forward edge. Pick-up is assisted by a toothed rotating cylinder. Stones are carried upward along the incline to be dumped into a truck. Inventor is Alois Louis Cintula, Norwood, Mo., awarded patent 2,553,240.

Science News Letter, June 2, 1951

BOOK SALE

Publishers' Clearance Makes Possible \$2-\$2.75 Savings. Titles in Physics, Mathematics, Biology, Mechanics, etc.

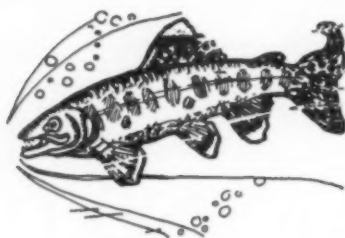
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Trout

► WHIRRRRRRRRR! The reel sings out, the rod's tip bends, a silver flash, another—the battle is on, Trout versus Angler. And may the better wit and the greater alertness, by no means definitely the Angler's, win the day.

For the time has come when the city dweller who is not too far from where swift, cold water flows will take a day on his week-end to slip out and try his luck with a rod in his favorite stream. And in a multitude of other places, the sons of Izaak Walton are piously conning their brevieries—to wit, their fly-hooks—and counting the days until they get their summer vacations.

Of all the finny gods in their calendar, they bow lowest, and most frequently, before the image of the trout. The bass may run him close, and the vicious pike or muskellunge claim devotion in moments of craving for a big fight with heavy weapons. But, in the end, the True Believer returns to the trout.

Slim and beautiful whether in the water or safely landed, swift with a speed that would seem to belong properly only to the birds of the air, water-wise and hook-wise with an intelligence that seems a shade supernatural in a mere fish, he is the prince and primate of all things that live in fresh water.

The various species of trout, home-biding fellows for all their adventurous disposition, have wandering brothers in the salmon. The salmon most sought after as game fish, indeed, are placed by naturalists in the same genus with trout, who even give them their own scientific name, "*Salmo*." The big salmon of the commercial fisheries are also rated as close relatives, but ranked in a separate genus.

Even though it does dwell permanently in fresh water, the trout can on occasion do some vigorous traveling on his own account. The Yellowstone trout used to be a good deal of a puzzle, because it was found in the headwaters of the Snake

River which drains to the Pacific, and also in Yellowstone Lake, on the Atlantic side of the divide. But the divide between the lake and upper rills of the river is in places a flat, wet meadow, and here in rainy seasons trout have actually been seen working their way over "the top of the world" through shallow pools.

Science News Letter, June 2, 1951

GENERAL SCIENCE

May Betray Atomic Secrets

► "WE MUST still keep our fingers crossed" about the possibility that Communist spies are even now in position to betray atomic secrets.

This is the opinion expressed by Dr. Eugene Rabinowitch, editor, in the BULLETIN OF THE ATOMIC SCIENTISTS (May).

Pointing out that since civilians took over from the military control of Atomic Energy Commission security matters there has been no known case of betrayal, Dr. Rabinowitch declares that nevertheless "the AEC should hesitate to take pride in this record before the Soviet archives are open to history."

The editor charges that the system of security now being used cannot guarantee that a disloyal scientist or worker has not or will not be able to penetrate into the innermost recesses of our atomic projects. We are trying to check too many thousands of people for loyalty and security, he declares, and thus the overburdened F. B. I. does not have the time to concentrate on the really important secrets and the really

● RADIO

Saturday, June 9, 1951, 3:15-3:30 p.m. EDT

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Selman A. Waksman, professor of microbiology at Rutgers University, New Brunswick, N. J., will discuss "Chemicals from the Soil that Cure."

important scientists who work with them.

With mass checking, he points out, we can only reduce, but cannot destroy altogether the possibilities of spies being able to do their work.

In commenting on the recent spy trials of the Julius Rosenbergs and David Greenglass, Dr. Rabinowitch declared that it is doubtful if the elaborate secrecy precautions which existed during the war did much good. He recalls that Maj. Gen. Leslie R. Groves claimed that the A-bomb was the best-kept secret in the world, with only half a dozen top people actually "in the know" as to what was being constructed.

Actually, Dr. Rabinowitch declared, most scientists worth their college degrees knew during the war that this country was constructing an A-bomb and that the effort was probably going to be successful. These facts were easy to deduce when nuclear physicists began disappearing in ever-increasing numbers from their laboratories.

Science News Letter, June 2, 1951

MEDICINE

Avoid Food Poisoning

► THE PICNIC season will soon be in full swing. This calls for a reminder of health dangers to be avoided at these otherwise pleasant gatherings. One of these is food-poisoning. Your grandparents called it ptomaine poisoning. Your doctor today will probably call it gastroenteritis. It is caused by germs which get into foods and produce their poisons, or toxins, in the food. The germs usually are members of the staphylococcus family which also cause boils. These germs thrive especially well in such foods as cream filled pastries, ham or other meat preparations, chicken, fish, eggs, and salad sandwich mixes made with mayonnaise. The germs also thrive well at room temperature. They get into the food when someone preparing or otherwise handling it has a boil or an infected cut finger, or who may have a cold or diarrhea.

If such food is kept clean, handled only by healthy persons and kept cold until eaten, it is not likely to cause food poisoning.

Another kind of food poisoning comes from eating germs themselves in food. These germs are mostly members of the Salmonella family. Rats and mice can spread them or they can get into the food from a person with the infection. Cooking kills these germs and chilling keeps them from growing.

Food poisoning is not the only picnic hazard. The water as well as the food can cause trouble. Wells, springs and streams in the country and even on some picnic grounds are not always safe to drink from. To be safe, look for a health department inspection sign saying the water is safe before you drink from such sources.

Science News Letter, June 2, 1951

A new dry mix for a chocolate-flavored milk dessert, that needs water but no heating, contains citrus fruit pectin, skim milk powder, cocoa, sugar and salt; it is a government product not yet on the market.

ENTOMOLOGY

Learn From Yellow Jackets

Yellow jackets, best known for their sting, should have taken patent rights on insulation and air conditioning of homes, scientist says.

► **YELLOW JACKETS**, best known for their sting, almost certainly gave man the idea for making paper from wood pulp and should have taken out patent rights on the insulation and air conditioning of homes, declares Dr. R. I. Sailer of the U. S. Bureau of Entomology and Plant Quarantine. He bases this on his observation of temperature regulation in one yellow jacket nest at the Michigan Biological Station.

The average temperatures inside the nest during a four-day period at the peak of brood-rearing activity was kept at 91.6 degrees Fahrenheit. At no time was it higher than 95.6 or below 87.8 degrees. Outside temperatures for the same period averaged 82.1 with a range between 65.4 and 107.6 degrees.

Unlike most yellow jacket nests this one was located in an exposed position and had only the paper layers of the envelope to protect the brood chamber from the influence of the outside weather. When first examined on July 10, the nest was three inches in diameter and had four layers of paper in the protecting envelope. At this

time the average temperature was 85.5 degrees.

By Aug. 1, when the nest temperature was highest and most stable, the nest was five inches in diameter and the cover contained 12 layers of paper. After Aug. 1 the nest did not increase in size and the colony's ability to regulate temperature began to decline. Since nests are normally occupied for only one season, this decline was not unexpected though it may have been premature.

For many years it has been known that honey bees regulate the temperature within their hives. In winter quarters the temperature is not allowed to fall below 57 degrees and in the summer, during periods of comb building and brood-rearing, the average temperature is between 92 and 93 and is held within a range of from 85 to 97 degrees.

It would therefore appear, states Dr. Sailer, that the brood of the honey bee and that of their rather remote relative, the yellow jacket, have strikingly similar temperature requirements.

Science News Letter, June 2, 1951

METEOROLOGY

Radar Spots Hail for Planes

► **RADAR** MAY soon be able to tell airline pilots whether they are running into dangerous hailstorms.

There is real hope, said H. T. Harrison, director of meteorology of the United Air Lines, and W. B. Beckwith, also of the United Air Lines, that further experience with radar, "will develop techniques which will actually accomplish this and thus go a long way toward putting thunderstorm navigation on a more precise basis."

Radar is already effective in indicating thunderstorms to the pilot, they said, but there is no way of knowing which storms contain hail of a size which would be damaging to a plane. However, they said, 96% of all hail encountered in the air in American Airlines-Navy flight tests occurred when the radar scope indicated that light rain was changing abruptly to heavy rain.

The two weather men reported their findings in the *BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY* (April).

They based their opinion on a detailed study of hail as it affects airline operation. Different insurance company hailstorm insurance rates, reports of damage to planes

in flight over the past ten years and results from special observation stations showed that the greatest danger from hail lies in an area extending from Texas to Canada east of the Continental Divide.

There seems to be little hope in predicting the presence of hail along a flight path. Hail is a part of thunderstorms and, the two scientists reported, it is believed by some that hail is necessary to the formation of a thunderstorm. Therefore, for the present, the pilot must depend on his experience and on advice from airline meteorologists in order to avoid damaging hail. In the future, radar techniques may be developed so he can recognize, in his cockpit, hailstorms which he must avoid.

Science News Letter, June 2, 1951

INVENTION

Alloys of Titanium Have Valuable Properties

► **WIDER USE** of the metal titanium in structural work is promised with an alloy possessing strength, ductility, hardness and

elastic properties on which a patent was issued by the government. It contains 90% titanium. The other metals are aluminum and molybdenum in varying proportions.

Titanium ore is very plentiful. Compounds of this metal are in wide usage, particularly the oxide used as a white pigment in paint. In recent years, commercial methods of obtaining the metal itself from its ores have been developed and titanium is becoming more common. It has many practical applications but for some structural purposes needs additional strength and ductility.

Patent 2,554,031 was issued to Robert I. Jaffee and Horace R. Ogden, both of Columbus, Ohio, for this alloy. Remington Arms Company, Inc., Bridgeport, Conn., has acquired the patent rights.

Science News Letter, June 2, 1951

TECHNOLOGY

Sugar Beet Molasses Yields Synthetic Rubber Chemical

► **SUGAR BEET** molasses can be changed to yield up one of the chemicals from which synthetic rubber is made. The method uses micro-organisms, tiny life forms. These ferment the molasses, changing its chemical structure in somewhat the same way yeast ferments grain mashes to give alcohol.

Butanediol is the chemical into which beet molasses, a cheap and plentiful agricultural by-product, is changed. The process, a continuous one, has been tried successfully on a factory-model basis. Butanediol is a source material for butadiene, base substance for the manufacture of several synthetic rubbers.

By the new fermentation method, 1,000 pounds of molasses yields about 177 pounds of butanediol, 41 pounds of ethyl alcohol, and 7 pounds of acetoin, a chemical used in the preparation of flavors and essence.

An input capacity of 60,000 pounds of molasses per day could be handled by a full-scale plant, the National Research Council of Canada in Ottawa estimates. The process was developed by the Council's division of applied biology.

Science News Letter, June 2, 1951

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Books of the Week

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ANTIBIOTICS AND VITAMIN B12 IN LIVESTOCK FEEDING—G. Bohstedt—*University of Wisconsin Agricultural Extension Service*, 6 p., paper, 10 cents. Answers many of the questions which are being raised about APF, the "animal protein factor."

BLOOD—YOUR GIFT OF LIFE—Alton L. Blakeslee—*Public Affairs Committee*, Revised ed., 32 p., illus., paper, 20 cents. This pamphlet No. 145 of the Public Affairs Series is a simple, direct description of the background, present setup and needs of the American Red Cross National Blood Program.

COOKING FOR CROWDS—Stella T. Patton and Gladys S. Stillman—*University of Wisconsin Agricultural Extension Service*, 24 p., illus., paper, 10 cents. Useful menus and hints for planning, preparing, and serving large groups of people.

THE ELK OF NORTH AMERICA—Olaus J. Murie—*Stackpole & Wildlife Management Institute*, illus., \$6.50. Bringing together facts about elk with suggestions for future management of this now scarce animal.

EVALUATING SCHOOL LUNCHES AND NUTRITIONAL STATUS OF CHILDREN—Clarence Velat & Olaf Mickelsen—*Govt. Printing Office*, Dept. of Agriculture Circular No. 859, 85 p., illus., paper, 25 cents. Reports a study made of the nutritional status and diet of children with and without a school lunch.

FARM CROPS: JUDGING, IDENTIFICATION AND GRADING—Hi W. Staten & Melvin D. Jones—*Blakiston*, 251 p., illus., \$4.50. A high-school and college text of special interest to teachers of agriculture, county agents, 4-H clubs, and farmers.

THE FIRST BOOK OF TREES—M. B. Cormack—*Watts*, F., 93 p., illus., \$1.75. The how's, what's and why's of trees' bark, buds, leaves, flowers, seeds and roots, explained for children. The book is filled with attractive drawings.

A FIRST ELECTRICAL BOOK FOR BOYS—Alfred Morgan—*Scribner's*, rev. ed., 263 p., illus., \$3.00. Simple and accurate explanations of electricity, how batteries work, how the telephone, telegraph, radar, television, etc., work.

HANDBOOK OF NUTRITION: A SYMPOSIUM—Council on Foods and Nutrition, A.M.A.—*Blakiston*, 2d. ed., 717 p., illus., \$4.50. Thirty-three leaders in the field of nutrition have contributed articles on individual nutrients, nutritional needs, deficiencies, and qualities.

HOW TO PAINT WITH BRUSH AND SPRAY—Sam Brown, Ed.—*Popular Mechanics*, 160 p., illus., \$2.50. The latest in the Popular Mechanics Craftsman's Library Series, this is intended to help you with home jobs of finishing and painting.

AN INVESTIGATION OF THE APPLICATIONS OF STATISTICAL QUALITY CONTROL TO DAIRY MANUFACTURING—A. V. Moore & J. P. CoVan—*Texas Engineering Experiment Station*, Research Report No. 23, 17 p., illus., paper,

free upon request to publisher, College Station, Texas. An opportunity for dairy manufacturers to learn how statistical quality control might apply to them.

THE KANSAS ROCK COLUMN—Raymond C. Moore and others—*Univ. of Kansas*, Bulletin 89, 132 p., illus., paper, 25 cents. Describes the sequence of rock strata in Kansas with the classification and nomenclature used by the Kansas Geological Survey.

MODERN MEDICINE ANNUAL 1951—*Modern Medicine*, 1125 p., illus., \$5.00. This volume contains the articles that appeared in the 24 issues of *Modern Medicine* during 1950. A comprehensive index is included.

A PSYCHOSOMATIC APPROACH TO SURGERY—Bernard J. Ficarra—*Froben*, 120 p., \$4.00. The basis for this book is a series of lectures given by the author on the general topic of "Psychology and Sanity."

PUBLIC HEALTH LAWS OF THE CITY OF PITTSBURGH—James C. Kuhn, Jr. & David Stahl, Eds.—*School of Law, University of Pittsburgh*, 1038 p., paper, \$5.00. An annotated compilation of the laws, regulations and ordinances of the State of Pennsylvania and the city of Pittsburgh governing the administration of public health in Pittsburgh.

RAPID SAMPLE PREPARATION METHOD FOR SOIL SELECTION IN EARTHWORK CONSTRUCTION—Bob M. Gallaway—*Texas Engineering Experiment Station*, Research Report No. 20, 11 p., paper, free upon request to publisher, College Station, Texas. Describes a new soil selection method using methyl alcohol.

RATES OF RETURN, CLASS I LINE-HAUL RAILWAYS OF THE UNITED STATES, 1921-1948—Sidney L. Miller, Virgil D. Cover & others—*University of Pittsburgh Press*, 211 p., illus., free upon request to publisher for those seriously interested. An analysis and an appraisal embodying a comparison with other industries, regulated and unregulated.

A ROTARY THERMAL RECTIFYING COLUMN—Edgar S. Byron, John R. Bowman & James Coull—*Mellon Institute*, Reprint, 10 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. Reprinted from *Industrial and Engineering Chemistry*.

SOME PROPERTIES OF HIGH-PURITY SINTERED WROUGHT MOLYBDENUM METAL AT TEMPERATURES UP TO 2400° F—R. A. Long, K. C. Dike & H. R. Bear—*National Advisory Committee for Aeronautics*, Technical Note 2319, 75 p., illus., paper, a limited number are available free from NACA. Experimental results showing the superior qualities of molybdenum.

SPACE—TIME—MATTER—Hermann Weyl—*Dover*, 330 p., \$3.95. This translation by Henry L. Brose from the German *Raum Zeit Materie* deals with the space-time aspect of classical physics.

STANFORD RESEARCH INSTITUTE ANNUAL REPORT 1950—*Stanford Research Institute*, 32 p.,

illus., paper, free upon request to publisher, Stanford, Calif. A survey of the Stanford research activities in the fields of defense research, industry, nutrition, electrical engineering, international research, etc.

TAKING CARE OF DIABETES (Kit of Materials)—Federal Security Agency—*Health Publications Institute*, 55 items, \$49.80. A complete kit of audio-visual aids including charts, filmstrips and accompanying records and carrying case, specially designed for teaching groups in clinics. There are booklets for patients to take home and aids in meal planning.

TECHNION YEARBOOK, 1950 Mid-Century Edition—Judah Wattenberg, Ed.—*American Technion Society*, 352 p., illus., paper, \$3.00. Current trends in science and technology described in articles aimed at promoting an exchange of ideas between America and Israel.

VISUAL EDUCATION FOR THE DENTURE PATIENT—George Henry Burtenshaw—*Dental Patient—Education Film Co.*, 32 p., illus., paper, 50 cents. Numerous illustrations to aid in instructing patients in the use and care of their artificial dentures.

YANKEE VIKING—Livingston Hartley—*Exposition Press*, 155 p., \$3.00. Fiction. Not science, of course, unless we call history and political science a science. The psychiatry is incidental and no one recalls dreams just in this way. The fact that the hero has to figure out the answer himself is sound psychiatry.

Science News Letter, June 2, 1951

OCEANOGRAPHY

Plumb Sea Water Depths Twice Those Reached Before

► **SEA WATER** samples from depths nearly twice those ever reached before by man will be brought to the surface for the first time this fall, the University of California's Scripps Institution of Oceanography, La Jolla, Calif., foresees.

Exactly what sort of life forms will be found at these tremendously deep ocean places, more than six miles below the surface, is not known. Pressure that far down is well over a thousand times that on the earth's surface. Scientists expect that they will find microorganisms of a special kind, known as barophilic, or pressure-loving.

After being dredged up from the ocean's depths, the microorganisms will be kept in refrigerated pressure bombs that reproduce their normal temperatures and pressures.

How they react when temperatures and pressures are changed can then be studied under controlled conditions.

Dr. Claude E. ZoBell, professor of marine microbiology at Scripps Institution, will head the round-the-world collecting expedition. Dr. ZoBell hopes to learn more about life processes in general, and, in particular, to investigate one kind of bacteria that seems to be able to grow continuously with little or no splitting up to form new cells.

Science News Letter, June 2, 1951

Distemper is one of the most common diseases among dogs.

OCEANOGRAPHY

Chart Cyclone-Like Eddy

Birth of large, anti-clockwise eddy in Gulf Stream charted. Equivalent to "formation of cyclone in the westerlies at high altitudes."

► THE BIRTH of a large, anti-clockwise eddy in the Gulf Stream has been charted by scientists. This is equivalent to the "formation of a cyclone in the westerlies at high altitudes," states Dr. Columbus O'D. Iselin of the Woods Holes Oceanographic Institution, Woods Hole, Mass.

The Gulf Stream and jet streams high in the atmosphere have several features in common, as pointed out by Dr. C-G. Rossby, University of Chicago meteorologist. First found during the last war, these jet streams have considerable influence on our weather, and are regularly considered by Weather Bureau forecasters in making their predictions. At 20,000 to 30,000 feet above the earth, the jet streams race along at 150 or more miles per hour.

More information about these jet streams would enable pilots to take advantage of the powerful winds on long east-west flights. Scientists can learn more about the jet streams by studying the Gulf Stream, which is much handier and easier to investigate.

Dr. Iselin estimates that the sorts of changes that take place in one day in

the atmospheric jets require a week or more in the Gulf Stream. Thus even a slow ship can follow the development of an individual feature, such as an eddy. Balloons radioing jet stream observations back to earth can now follow only the general features of the jet streams.

For both the jet streams and the Gulf Stream, the stream remains constant for much longer than present knowledge can account for. There seems to be a preferred width and a preferred velocity to the streams' currents, the energy having been acquired well upstream from the point where the jet begins to develop.

In both cases it appears that physical obstructions are the reason that the extreme meanders develop, Dr. Iselin states in a report on the Gulf Stream survey in the TRANSACTIONS OF THE NEW YORK ACADEMY OF SCIENCES (Dec., 1950). The cause of the meandering seems to be located well down stream from the area where the meanders first begin to form, he concludes.

The Gulf Stream survey was made in cooperation with the U. S. Navy's Hydrographic Office in Washington, D. C.

Science News Letter, June 2, 1951

PHYSICS

Yo-Yo Teaches Physics

► THE YO-YO, popular children's toy, is being used by a physics professor to help teach his classes some of the basic principles of mechanics. This is the branch of physics dealing with the laws followed by all moving bodies.

The simplest, most usual motion of a Yo-Yo is that of throwing or letting it drop down its twisted string. It will rotate about its axis, or "sleep," in a loop at the bottom of the string until a sharp pull causes the top to roll itself and the string back into the operator's hand.

A discussion of this down-and-up motion brings out nearly all of the elementary ideas about translation, or straight-line, and rotational motion, Dr. Irving J. Kofsky, of Syracuse University, points out. The sleeping Yo-Yo also illustrates two other principles: its rotational momentum prevents the string from unwinding, so that it acts as an extremely simple gyroscope, and certain vibrations, showing resonance, are set up in the string.

Dr. Kofsky concludes his classroom demonstration with the following trick:

The top is thrown down as sharply as possible, and while it sleeps, the string is released from the finger to which it is attached. As it is released, the top of the string is grasped between the thumb and index finger of the left hand, palm down.

A sharp slap on the back of the left hand and release of the string as soon as the sleeping Yo-Yo has caught causes the top to fly up the string, and now, spinning more slowly, to reach a level several feet above his head, with the string all wound up. Dr. Kofsky then catches the Yo-Yo in a coat pocket on the way down.

Science News Letter, June 2, 1951

ZOOLOGY

Rare Hawaiian Seal Arrives on Mainland

► THE FIRST Hawaiian monk seal to reach the American mainland is now on exhibit at the San Diego, Calif., Zoo after an air journey from Honolulu.

Now exceedingly rare, this species is represented in captivity by only one other specimen in the Honolulu Zoo, whose director, Paul L. Breese, captured both animals. So abundant once were these animals in the Hawaiian leeward islands that sealers slaughtered thousands during the past century.

The San Diego Zoo seal is a nursing pup, dark brown above, paler on the sides, and almost white beneath. It is three feet long but when it grows up Ken Stott, Jr., general curator of the Zoo, expects it will reach a length of six or seven feet.

Science News Letter, June 2, 1951

MEDICINE

Find New, Life-Saving Use for Cortisone

► AN "EARLY and urgent report" of a new potentially life-saving use for cortisone is made by Dr. Joseph Freeman of Mount Sinai Hospital, New York, to the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (May 26).

Seven patients threatened with suffocation because of swelling of the voice box in the throat were relieved of the dangerous swelling within 11 to 24 hours by "full doses" of cortisone, Dr. Freeman reports.

In two of the patients the swelling followed a course of protracted radiation treatment for cancer of the larynx. In four the condition was due to croup. In the seventh the swelling was due to an abscess that formed after a foreign body got in his throat. This patient had been given antibiotics, or so-called mold remedies, for 36 hours previously without effect.

Science News Letter, June 2, 1951

The ear of the deer is superior to that of the hunter in hearing faint sounds, largely because its outer ear is movable and can be turned to the best position to pick up a sound.

Chestnuts do well in some parts of California and this state is the largest American producer of these nuts since the extermination of all eastern chestnut trees by blight a few decades ago.

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✿ **DELAYED ACTION SWITCH** for the lighting system leaves a dim light for about a minute after the switch is thrown to turn the lights off, long enough time to permit the operator to get safely out of a room. It is easily installed in existing wall outlets.

Science News Letter, June 2, 1951

✿ **PLUG-IN STRIP**, with frequent outlets for electric appliances, is designed to fit around the room at the top of the baseboard as a finish trim. Outlets are provided every 18 inches, and the strip has grounding receptacles for safely grounding electrical appliances.

Science News Letter, June 2, 1951

✿ **PORTABLE DRAFTING BOARD**, to hold business letterhead-size paper, is made of rigid plastic with button clamps in the corners to hold the paper. Two metal straight edges, one vertical and one horizontal, are retractable to permit the ready use of triangles on all four edges.

Science News Letter, June 2, 1951

✿ **IMITATION CIGAR**, a recently patented toy for a youngster, is a cigar-shaped tube with a flattened mouth piece at one end and an ash-resembling butt on the other. Inside is a tiny battery and flashlight which lights the ash-end when the mouth-end is bitten.

✿ **EASY-THREADING NEEDLE** for the sewing machine is fed by sliding the thread, held taut by two hands, down the shank



of the needle, as shown in the picture. Near the top of the needle is the slot into which the thread passes to be carried down to the eye. When once down to the eye, it remains there.

Science News Letter, June 2, 1951

✿ **DIALING DEVICE**, for use with the telephone, eliminates manual dialing and automatically calls numbers when a single button is pushed. An arm of the device fits over the dial and a rubber finger within does the work. About 500 numbers may be set up on the device for push-button dialing.

Science News Letter, June 2, 1951

✿ **"MOBILE BAR"** is a truck-mounted bar room in use in England for serving drinks at outdoor events. It is an aluminum "ten-wheeler" power unit and trailer, with refrigeration for seven barrels of beer and 3,500 half-pint bottles. One side, when raised, forms an awning to provide overhead shelter to customers.

Science News Letter, June 2, 1951

✿ **INTERIOR WALLBOARD**, suitable also for other uses, is somewhat similar to ordinary three-ply board but its inner layer is made of medium size wood chips. Outer surfaces are thin laminated wood sections. The segments are resin-coated, and fused together under heat and pressure.

Science News Letter, June 2, 1951

Do You Know?

In prehistoric times the *sweet potato* was used for food in two widely separated parts of the world, the tropical Americas and some of the islands in the Pacific.

Sturgeon, once a plentiful giant fish, was found principally in ocean water but some of the 20 known species live entirely in fresh water like those of the Great Lakes.

Certain highways which do not provide sufficient breaks in driving monotony seem to produce a "hypnotic" effect on a driver that may result in an accident.

Artists are using *aluminum* sheeting in place of the traditional canvas for oil paintings.

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